Identification of phytophthora spp. from perennial crops in Malaysia, its pathogenicity and cross-pathogenicity

ABSTRCT

Phytophthora is one of the most important plant pathogens of perennial crops in the tropics. This study characterised the pathogen(s) responsible for cocoa black pod rot, rubber pod rot and durian stem canker. Eighteen Phytophthora isolates were collected from several states in Malaysia, namely Pahang, Johor and Selangor. A total of 12 Phytophthora palmivora and six Phytophthora nicotianae isolates were isolated and identified based on the morphological and molecular characteristics. Internal transcribed spacer (ITS) sequences enabled Phytophthora identification to species level. Inoculation of 18 isolates on detached leaves and unripen cocoa pods successfully demonstrated the progressive development of lesions on its original host. Lesions were also observed in all wounded detached leaves of young durian (clone D24) and rubber (clone RRIM600) and unripen cocoa pods (clone BAL244) regardless of host and isolates. Phytophthora isolates from durian (DSCI) and rubber (R4A) used to inoculate cocoa pods exhibited lesion sizes of 11.6±0.75 and 9.6±0.64 mm, respectively. However, Phytophthora isolates from cocoa (CPR25) developed a longer length of lesion of 18.6±0.47 mm. On durian leaves, Phytophthora isolate from rubber (R4A) and cocoa (CPR25) recorded 11.73±1.04 and 5.22±0.57 mm length of lesion while Phytophthora isolates from durian (DSCB4) produced 13.13±1.29 mm lesion on its native host. Isolates from cocoa (CPR22) and durian (DSCE3) infected rubber leaves with 3.74±0.48 and 2.55±0.31 mm length of lesion, in comparison to rubber isolates (R1B) with 5.43±0.23 mm length of lesion. Differences in the length of lesion demonstrated higher level of virulence on the native host.

Keyword: Cross-pathogenicity; Internal transcribed spacers (ITS); Pathogenicity; Phylogenetic tree; Phytophthora